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## PHYSICAL GEOGRAPHY IN SECONDARY SCHOOLS

THE plea of this paper is that physical geography including the history of land forms should have an established place in secondary education. This cannot mean less than one year of sustained work, so pitched as to demand the best powers of the student. In emphasizing the physiographic phase, we do not exclude, but rather require, in their higher aspects, the other departments of physical geography. Here falls organic distribution as understood only on the basis of geographic evolution. To know how oceans and continents, plains and mountains, have come to be, gives ground to understand environment and migration, with the means by which the latter is affected, and the limitations to which it is subject. Meteorology also is essential, at once affected by and influencing topographic development, and dealing with natural events which are of daily interest to man. Commercial geography, too, will have a fuller interpretation than is possible in the grades, and physical environment as controlling history in its critical stages, will yield the ripest fruit of geographic study.

This scheme involves progressive instruction in the lower grades, in simple dynamic agencies and results, in the forms and habits of animals and plants, in the distribution of land and water, and of all geographic units, physical and political, all as far as possible taught in a causal and rational manner, from the things themselves, or the best obtainable representations of them.

I propose to urge my thesis chiefly upon its claims for culture, and under two heads, information and discipline.

Here is a great body of facts about the world in which we have our home. These facts do not merely supply essential knowledge for our daily conduct, they enlarge the mental horizon, add to our dignity and sense of responsibility as citizens and

rulers of the world, and in a large way help us discern and handle the problems of life and society. No man is prepared to think truly, who does not in some measure appreciate the world and its organisms as evolutionary. We deal with facts, but with facts genetically related, and hence not nakedly informational. We study concrete things, to be sure, but in the light of their history, and as having their goal in man. For this point of view the secondary school has no resource but geography. If we seek illustrations they are legion—the origin and development of our planet, in its larger features, the making and meaning of natural scenery; soils, economic minerals, and all earth resources. What right has the school to leave any mature pupil ignorant of the nature of coal and of the geographic conditions of its origin? Can anyone weigh the saving to this country, if the farmer and the legislator understood the prolonged genesis and the supreme value of soils? How many know that a building stone ought to have in a wall the attitude which nature gave it in the quarry? Had the woman been taught geography, who, having seen the caterpillar mountains of the conventional map, spoke of the Ontario and Western railway as running along the base of the Catskills? I have seen college students surprised to hear that the hills of the Alleghany plateau in central New York were not the result of deformation. How large is the loss to the citizen of the northeastern United States, who has no eye for glacial topography, and to whom the varied and impressive structures of the ice time are Greek, or more likely have elicited no inquiry whatever. The complex functions of a river, the structures that border it, the fascinating chapters of its history, are material of rational geography, falling daily under the eye of man, and, if understood, enriching all his thought. Lead a boy to inquire why Chautauqua's waters seek the long way to the gulf, instead of spilling over into the adjacent Erie, then show him how the Allegheny, and perhaps the Monongahela, once drained northward, and you have widely extended his mental view. Finally, initiate him into the principle of the base level, show him that all land surfaces tend toward that goal, display before him the

forms that intervene, and the vicissitudes that interrupt the process, and you have given him a range of information that runs all the way from the severely practical and utilitarian to the distant and the ideal.

But geography is a discipline. In a rarely complete and symmetrical way the mental powers are brought into exercise. The old geography taxed the memory. The new geography trains the memory, not by loading it in an arbitrary manner, but by the association of materials of infinite variety by a causal bond which will not admit of dissipation as soon as the pressure of will and the stimulus of impending examination is removed.

In its service to the observational capacity and habit, geography is not behind any other science. Here the deficiency, even among educated people, is startling. And it is especially when out of doors that they see and do not perceive. The average man has no sense of topography. He cannot tell time by the sun, is in peril if left alone in the woods, could not describe the clouds which he saw while the storm was coming up, or give a true and vivid account of a ride in the country. Schooled to the last degree in other disciplines, he has been blinded to mother nature and is an orphan in the midst of his home. The very savage has a keener eye and a deeper love of wood and field than the supercivilized and dull-eyed child of the humanities. I shall not forget the good woman *en route* among the Rocky Mountains, who had lived a year in Grand Junction and thought it was situated to the south of Denver. It is in the training of the observation that representative geography, and all forms of laboratory exercise in geography, have the largest value.

It is, however, in the exercise of the reason that geography offers its best service as a discipline. To run from effect to cause, from cause to effect, to compare, to judge, to classify, is the unceasing prerogative of geography. It is of less worth to know the area and tonnage of the Great Lakes than to know something of their history. The materials for such instruction are now available to the alert teacher. Successive stages in their history are inferred from a series of elevated shore lines.

The passage of a beach into a moraine in western New York argues water in one part of their basin and ice in another. Varying levels of the same shore line prove subsequent tilting of great areas of country. Various considerations argue for and against the presence of marine waters in the earlier stages of the history. To bring this single theme to the understanding of a high-school class would be to them a revelation, for it does not occur to one man in a hundred that these bodies of water are the result of physical history, much less that the chapters of the history can be reasoned out and made to live again.

A not difficult study of the Hudson River and valley will lead the student along lines of logical certainty to important and keenly absorbing conclusions as to earlier geographic conditions. Take also that great field scarcely scratched by tillage as yet, the relation between physical environment and national development, "Man is what he eats." Let us make it broader than that—man is, *where he lives*. To trace out such connections is the business of geography. We shall sometimes blunder, but we shall find a sure substance of truth. Rossiter Johnson says that secession was an attempt to make two sovereignties where there was no natural barrier. Let the teacher get hold of that truth. Let him seek for comparative facts. "The kingdom of Poland passed out of existence because it had no natural boundaries." Contrast Greece, Spain, Switzerland, Scandinavia, Great Britain. Follow up the relations between mountains and history, or shore lines and history, and see how fruitful it becomes for the reason and for the whole intelligence. Trace the isothermal of 48, in at Cape Ann, across New England, southward into Georgia, straight north into Ontario, west by Detroit and Chicago and the Black Hills, south into New Mexico, far north again, south around the Pacific mountains, north and into the western ocean at Puget Sound. How profound the bearing of this elaborate curve upon the economics and history of the United States, and how rich the field for rational teaching.

Some one has said in substance that whatever increases our

interest in that which is remote in time or space enlarges our culture and promotes our dignity as thinking beings. We emphasize, indeed, home geography, not chiefly because it affords convenient knowledge, such as how to drive to the next town, but because it unfolds principles, yields types, and helps us conceive the larger and the unseen. To come to the point, no other school subject so exercises the constructive imagination as does the new geography. The pictures of other continents and of other times must be sketched and colored by rallying the student's highest powers. This means a high order of teaching, but of this we are not now speaking. Give appreciation of the subject and this will raise the order of instruction to its proper level.

We emphasize here the historical and time sense. The earth is not dead. There are no "dead" geographic forms. There is not even stagnation. The earth never hibernates. When Mark Twain was a cub pilot on the Mississippi it distressed him that he must learn 1200 miles of river. Then he must learn it both ways; must know it at noon and know it in midnight darkness. Then when he has learned it, he said, "won't it go fooling around?" Ah, precisely that. The earth is all dynamic, vital, evolutionary. It has been so for eons. Geography is not taught till this conception is gained. Here in the secondary period is your only opportunity to give this vastly important sense of duration, of events transpiring upon a background of infinite time. You cannot tax children in the grades with it. They cannot receive it. You cannot depend on courses in historical geology, or on the college, for most will have experience of neither. Rational geography will give this rich enlargement to the intellectual life, and go far to wean it from the narrow, the conventional, and the untrue. Here is your opportunity to gather up the ripest fruit of the most pervasive and most educationally pervasive, doctrine of our time, evolution.

The æsthetic and moral value of an introduction to genuine geography enforces its claim in no meager fashion. These

considerations emerge naturally in this field. The world is a constant and high revelation to him who holds its secret. Nature as affording refinement and repose for all, must be interpreted to the scholar, else his education is partial and without symmetry. This is the one science whose materials of observation are at hand throughout life, though balance and measuring rod, and microscope and books be absent. In this field, therefore, knowledge may, after preliminary training, grow almost without effort. It is a tree which must grow tall and send out spreading branches when once the seed has germinated. Form, proportion, arrangement, and color are the perennial lessons of geography to the appreciative spirit. The delight afforded by the beautiful and true in nature is a valid educational motive. Here is the needed repose of body and soul in the rush of modern life. Here, too, is soil for purity and moral purpose. With singular unanimity eminent men and women have summed up the influence of Niagara as a sense of peace for the spirit. Some one, perhaps Emerson, touched this moral quality of things when he said, "Nature is loved by that which is best in us." The geologist Ramsay, taking his noon-ing in the presence of a far view on one of the Welsh mountains wrote, "As I looked, I felt my heart soften, and I rose a better man again." Russell, daring, and all but conquering the heights of Mt. St. Elias, said: "The fortunate traveler who stands on these commanding points in brilliant weather will have a charm added to his life of which no changes of fortune can deprive him." And Whittier, fully appreciative of the curative power of the world where man finds his home, wrote:

"How the eye and ear  
Are starved amidst the plenitude  
Of nature, and how hard and colorless  
Is life without an atmosphere."

Geography then is not a bread and butter theme, though supremely practical. It is not chiefly an informational theme, though rich in store of fact. It is not an easy nor a dull theme, but full of substantial difficulty, and throbbing with interest.

Because it makes so broad an appeal to the eye and reason, to imagination and taste, it commands interest and asserts thus its pedagogical value. The common mind can be counted on when common things about the earth are explained by one who knows and loves them. Not seldom will the teacher have his reward in being told that to a young man, his native hills and valleys, and his travel over the world, will have, henceforth, new meaning for him.

I have asserted the educational value of geography in no measured terms. I have hinted at a geography which is too advanced for the grades, too important to be omitted, and which most will not reach in college. This testimony is not without strong support. Says Archibald Geikie: "I long have been of opinion that geography in this sense of the term ought to form an essential part of education. It ought as a matter, of course, to occupy a distinct and important place in the curriculum of every high school." Keltie, in his well-known report, says of geography in Germany: "It is a serious subject of education, legislated for by the government, and taught to a large extent by trained teachers." It was Kant who wrote, "Nothing is better calculated to awaken the healthy human intelligence than geography." An English schoolmaster writing of physical geography says: "It was eagerly studied and brought out unexpected enthusiasm in some of what were thought the stupidest and laziest boys." Superintendent A. F. Nightingale enumerates physiography among the subjects which "are no longer to remain in the category of informational studies and suffer the opprobrium of being contrasted with the humane and the literary as the sole dispenser of intellectual culture." Mackinder said: "A worthy geography is no pariah among intellectual disciplines." And finally I quote the Committee of Ten, "There can be no doubt that the study (as proposed) would be interesting informing, and developing, or that it would be difficult and in every sense substantial."

Much has been made, and sometimes, I think, in unbecoming fashion, of the admission of the conference report to the



Committee of Ten, that the literature of geography was not in good form. This is much less true today than when the report was written, and is but best a temporary consideration. There is too much geology in it, say some. I reply, not over much,—and add, that between the geology and the geography no sharp line can, or need be drawn. The geologist is bound to teach some geography from the geologic point of view, and the geographer must teach some geology from the geographic point of view. Students of nature ought not to grumble because hard and fast lines are not found. Nor does Professor Palmer's objection hold, that strong courses in physics, chemistry, mineralogy, and biology are pre-essential to physiographic work. All of this is desirable, and much of it is necessary to the teacher, but the pupil is not to be denied rational geography till he present this preparation.

Where then shall we put geography in the high school? On this I defer to experienced makers of secondary programmes, but I urge again that it will not do to put it into the first year on sufferance, waiting for developing "science in the grades" to pull it down to a lower horizon. Better send it forward to the third or fourth year, and get first as much as possible of the physics, chemistry, and biology which all of us agree with Professor Palmer in counting important.

And if the same authority will allow me to criticise him again, I challenge his so-called "expensive waste of time on the physiographic studies," and "finishing course" though it be, and urge again the needs of that vast majority of high-school graduates who will not go to college but who will constitute the enlightened society of our time. The culture offered by the new, rational, and higher geography is too broad and too precious to be denied to this great body of educated men and women. That we have not yet a competent body of teachers I grant, but this too is a matter of brief time. And we must not forget that geography cannot be taught in the grades until the grade teachers get it in the high schools. The universities will equip the high-school teachers, and they in turn will do like service

for those below them I have no fear for geography. It is a safe principle that no doctrine in theology and no discipline in education will be lost if it ought to survive. "Truth is a good swimmer." The writer was trained to the classics, and the most conservative stickler for Greek and Latin could find no fault with his bachelor's degree. Everyone knows that Greek and Latin have grown green in the new educational freedom. They are no longer dead, but have become living branches of the tree of knowledge. Latin could not be put out, and geography cannot be shut out. Taught rationally in the grades, it asserts its rights in the secondary school, and holds its distinctive ground in the college and in the university.

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